Department of Environmental Protection
Bureau of Land & Water Quality April 2000

O&M Newsletter

A monthly newsletter for wastewater discharge licensees, treatment facility operators, and associated persons

Spring 2000 Exam

Those who signed up for the Spring Wastewater Exam should have received confirmation by now. Anyone who submitted an application and who has not heard from us by now should call Leslie Rucker at 287-9031 as soon as possible.

UPCOMING TRAINING COURSES

April 10 & 11, 2000 in Hinkley (SAPPI - S.D. Warren Mill), Basic Identification of Filamentous Organisms in Activated Sludge – approved for 12 hours, sponsored by JETCC (207) 767-2649
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April 12, 2000 in Bangor, ME, Living with the New Biosolids Regulations – approved for 6 hours, sponsored by JETCC (207) 767-2649
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April 25, 2000 in Portland, ME, Performance Management – approved for 6 hours, sponsored by NEIETC (978) 323-7929
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April 28, 2000 in South Portland, ME, Basic Chemistry for Plant Personnel – approved for 6 hours, sponsored by JETCC (207) 767-2649
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May 1,2 & 3, 2000 in North Conway, NH, Advanced Process Control for Activated Sludge – approved for 15 hours, sponsored by NEIETC/JETCC (978) 323-7919
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May 17, 2000 in Skowhegan, ME, Troubleshooting Activated Sludge – approved for 6 hours, sponsored by JETCC (207) 767-2649
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May 23, 2000 in Portland, ME, Using Computerized Databases in the WWTP – approved for 6 hours, sponsored by JETCC (207) 767-2649

For Practice

1. The only backflow prevention device which insures that wastewater and potable water will never be mixed is
   a. A flapper valve
   b. A ball valve
   c. An air gap
   d. a vortex separator

2. A BOD test was run using three dilutions of the same sample. What is the BOD?

Sample Volume	Initial DO	Final DO
3 mL	8.0 mg/L	5.8 mg/L
5 mL	7.9 mg/L	4.0 mg/L
8 mL	7.4 mg/L	1.5 mg/L

a. 190 mg/L
b. 200 mg/L
c. 225 mg/L
d. 250 mg/L

3. If the return sludge rate does not change and the influent flow and BOD concentration remain constant, the MLSS in the aeration basin will most likely…
   a. Remain the same
   b. Increase
   c. Decrease
   d. Depend on the air temperature

4. If an operator has a stock solution of acid that is 10N and he wants a solution of 0.5 N acid, how much acid and distilled water should be mixed to make a liter of proper strength solution?

   a. 200 mL acid + 1000 ml of water
   b. 100 mL of acid + 900 ml of water
   c. 50 ml of acid + 1000 ml of water
   d. 50 mL of acid + 950 ml of water

Answers to *For Practice:*

1. c. an air-gap is the only acceptable method to prevent cross-connections between wastewater and potable water.

2.
c.

Sample Volume	Initial DO	Final DO	BOD
3 mL.	8.0 mg/L	5.8 mg/L	220 mg/l
5 mL	7.9 mg/L	4.0 mg/L	234 mg/L
8 mL	7.4 mg/L	1.5 mg/L	221 mg/L

All three results are valid. To get the final BOD, average the results giving 225 mg/L

3. c. The MLSS is mass of microorganisms in the aeration tank. If more flow comes into the plant, the plant will receive more water. If the return sludge rate remains constant, there will be more water per unit of sludge. Thus, the MLSS decreases

4. d. The normality of the final solution is given by (Volume of Acid X Normality of Acid)/Total Volume

Solving backwards: Volume of acid = (Total Volume X Normality)/Volume of Acid

Volume = 1000mL X 0.5/10 = 50 mL of acid + 950 mL water = 1 liter 0.5N acid solution

A Reminder on Reporting of Priority Pollutant Test Results

All facilities conducting priority pollution testing under the Chapter 530.5 of the Department's rules are reminded to include plant flows along with their analytical results. Under the toxicity protocols published in July 1998, the flow information will allow DEP to evaluate results for water quality exceedences using the quantity of pollutants actually discharged. Previously, exceedence calculations had assumed the facility's full licensed flow. Using real-time flows will give a more accurate assessment of the actual discharge, and its potential for water quality impact. The Department protocol itself reads,

> "Exceedence evaluations for priority pollutants will be done using the quantities (mass) discharged. Calculations will be based on the facility's flow on the day the sample was collected for acute criteria and the monthly average flow for the chronic and human health criteria. Allowable water quality criteria will be stated in pounds based on the facility's licensed flow and the appropriate stream design flow (1Q10, 7Q10 or harmonic mean). In situations where a treatment facility's flow augments the stream flow (as is the case with most POTW's), DEP's calculation of allowable mass limits will reflect the differences in dilution factors resulting from actual flows being below the facility's full license amount. RP calculations will continue to use concentration and the facility's license flow."

Also, when submitting priority pollutant test results on computer diskette, the disk should be properly labeled to help avoid reporting glitches and to provide the proper information for the Department to process the test results. Facilities should make sure that the labels on priority pollutant reporting disks have the following information:

- The name of the facility
- The date the sample was collected
- The facility's daily average flow the day the sample was collected
- The facility's monthly average flow for the month in which the sample was collected
- The name of the lab(s) conducting the tests

As always, your cooperation is appreciated.

Dennis Merrill

For Practice

In last month's ***For Practice*** there was an error in the solution of problem 2. The following is a restatement of the problem and the correct answer.

2. Given the following data, how much sludge should be wasted?

   Plant flow
   1,250,000 gallons/day
   Current F:M ratio 0.18
   Target F:M ratio 0.20
   MLSS Concentration 3083 mg/l
   MLVSS/MLSS ratio 0.82
   Aeration Tank Volume
   450,000 gallons
   Influent BOD 186 mg/L
   Waste Sludge SS 8300 mg/l

   a. none
   b. 11,196 gallons
   c. 12,473 gallons
   d. 13,710 gallons

Answer (d)

. F:M Ratio = (Pounds BOD)/(Pounds MLVSS)

Pounds BOD = 186 X 1.125 X 8.34 = 1,745 lbs *The BOD concentration was incorrectly set at 182 mg/l in the March newsletter*

Pounds MLSS = 3083 X .45 * 8.34 = 11,570 lbs

Pounds MLVSS = lbs MLSS * 0.82 = 9489 lbs.

F:M ratio = 1,745/9489 = 0.18

Target F:M = 0.20 = 1708 lbs BOD/ Target Lbs MLVSS

Target Lbs MLVSS = 1,745/0.20 = 8725 lbs

Lbs MLSS = 8725/0.82 = 10,640 lbs MLSS

Solve using the data given: Pounds To Waste = (11,570 – 10,640) = 930 lbs

Determine the gallons to be wasted: Gallons wasted = (pounds wasted * 1,000,000) (waste sludge concentration * 8.34)

Gallons Wasted = (930 * 1,000,000)/(8300 * 8.34) = 13,435 gallons

The closest answer is (d). I apologize for any confusion this caused.

Dick Darling